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sor Dr. HOLTERMANN, a docent in the botanical institute. The work does not profess to be a verbatim report of SCHWENDENER'S lectures (which he himself could not make ready for the press), but is an expression of his views, based upon his lectures, published works, and personal communications; and moreover, the book has had his revision. The contents must suffice to show the character of the work: The mechanical system; Theory of phyllotaxy; Ascent of sap; Stomata; Twining; Tension of cortex; Distortion of pith rays by excentric growth; Apparatus for gliding; Turgor movements; Hygroscopic curvatures and torsion.

To have these topics treated clearly and tersely is extremely useful, and Dr. HOLTERMANN'S service will be appreciated.—C. R. B.

Pflanzenfamilien.—With the exception of a supplement to the section on lichens, which is in preparation, this monumental work⁹ has come to an end with *Lieferung* 235, concluding BROTHERUS' exposition of the mosses. It has been in course of publication since 1887, the last part being issued in March, 1909. The high appreciation of botanists all over the world must be the reward of the distinguished senior editor, ENGLER, whose great plan has been so successfully executed. To the publisher, WILHELM ENGELMANN, also, are due congratulations for his courage in undertaking so huge a work, whose commercial success must have been problematic at the outset, and for his efficiency in the details of publication.—C. R. B.

NOTES FOR STUDENTS

The perithecium of Ascomycetes.—The whole of Vol. X of *Le Botaniste* is devoted to an elaborate paper by DANGEARD¹⁰ on the origin of the perithecium in the Ascomycetes. Pages 1-26 are devoted to a general discussion of the subject, while pp. 27-385 are given over to the description of the individual plants studied. The writer is committed thoroughly to a belief in the autonomous nature of the fungi as a group, and in the derivation of the higher forms from phycomycetous ancestors. He postulates at the outset that the ascus is an organ of the same nature throughout the group; that it had a common origin; and that the slight variations which appear are the results of adaptation. He is confronted with four diverse opinions regarding the nature of the ascus: (1) that it is a modified sporangium; (2) that it is a sporocarp or part of a sporocarp; (3) that it is a mother cell presenting special characters; and (4) that it is a sporogonium. Each one of these theories is then discussed. The first, which is that of BREFELD, regards the ascus as a sporangium in which the form has become fixed and the number of spores definite. This is held to be untenable, since it implies the complete absence

⁹ ENGLER UND PRANTL, Die natürlichen Pflanzenfamilien, etc. 234 und 235 Lieferung. Brachytheciaceae (Schluss), Hypnodendraceae. Nachträge und Verbesserungen. Von V. F. BROTHERUS. Teil I. Abt. 3. pp. 1153-1246. Leipzig: Wilhelm Engelmann. 1909. M 3.

¹⁰ DANGEARD, P. A., L'origine du périthèce chez les Ascomycètes. *Le Botaniste* 10:1-385. pls. 1-91. 1907.